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10/785,482	02/25/2004	Vitalij Lissotschenko	A-8948.RNFMP/cat	1771

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EXAMINER

HARRINGTON, ALICIA M

ART UNIT	PAPER NUMBER
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2873

DATE MAILED: 10/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/785,482	Applicant(s) LISSOTSCHENKO, VITALIJ	
	Examiner Alicia M. Harrington	Art Unit 2873	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 2/24/04 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The indicated allowability of claims 13,14,25,26,31,33 is withdrawn in view of the newly discovered reference(s) to Henningsen (US 6,529,265) and Mizouchi (US 5,963,305). Rejections based on the newly cited reference(s) follow.

Claim Objections

2. Claims 1, 11,22,23, and 27-29,39 are objected to because of the following informalities: The claims set forth limitations using characters (-). The limitations in a claim should be positively recited in the claim without the use of characters or drawings or reference numerals. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-12,14-30,32-39 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, the applicant claim, in lines 12-16, recite "the laser radiation onto **the surface** - which radiation is to be applied - of the object; wherein the array of lens elements arranged between the laser light source and the array influencing elements'. Thus, the Examiner is unclear as to how the array of influencing elements and array of

lens elements both focus (one array is in front of the other) on the object when the claim as whole defines the array of lens as preceding the array of influencing elements.

Therefore, the claim is indefinite. Claims 15,27 and 39 are also indefinite for the same reason as discussed above in regards to claim 1.

In addition, claim 1 recites the limitation "the surface" in line 11. There is insufficient antecedent basis for this limitation in the claim. Claim 15 recites the limitation "the surface" in line 11. There is insufficient antecedent basis for this limitation in the claim. Claim 27 recites the limitation "the surface" in line 11. There is insufficient antecedent basis for this limitation in the claim.

In additionally, claim 39 recites the limitation "the surface" in line 11. There is insufficient antecedent basis for this limitation in the claim.

Claims 2-12,14, 16-26,28-30,32-38 inherits their indefiniteness from independent claims for which they depend.

The claims will be examined as best understood by the Examiner.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-3,5,6-10,11,12,27-30,33,35,36,38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jain et al (US 6,515,257) in view of Henningsen (US 6,529,265).

Regarding claim 1, Jain discloses an apparatus for applying laser radiation to comprising (for example see figure 1, 4, 6):

a laser light source (26) generating laser radiation;

two-dimensional array (12; see figure 4) of influencing elements that can deflect and/or pass the laser radiation issuing from the laser light source in such way that laser radiation is applied to prescribable locations on the object; and

a two-dimensional array lens elements (10) that can focus the laser radiation or portions of the laser radiation onto the surface - which radiation is to be applied - of the object; wherein the array of lens elements arranged between the laser light source and the array influencing elements (see col. 7, lines 4-36 and col. 8, lines 45-65). Jain teaches controlling the mirror elements to position the pattern on the substrate. However, Jain fails to specifically disclose an embodiment wherein the scanning means permit the array of lens elements to be scanned with reference to the object and/or to the array of influencing elements.

In the same field of endeavor, Henningsen discloses an exposure system with a laser light source (21), array of influencing elements (24,25) and array of lens elements (23) such that a scanning apparatus permit the array of lens elements to be scanned with reference to the object (see col. 11, 50-67; col. 12; col. 13, lines 35-55). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was

made to include an scanning mean that permit the array of lens elements to be scanned as claimed, for the specific purpose of patterning an object with high illumination efficiency and resolution.

Regarding claim 2, Jain discloses the apparatus as claimed in claim 1, wherein the array of influencing elements (12) corresponds to the array of lens elements, in particular to the effect that each influencing element essentially assigned one lens element (see col. 7, lines 14-20).

Regarding claim 3, Jain discloses the apparatus as claimed in claim 1, wherein the focal lengths of the lens elements are selected in such way that the partial beams the laser radiation that have penetrated the individual lens elements impinge substantially on the influencing elements and not on an inter-space, possibly present between the influencing elements, of the array of influencing elements (see col. 7, lines 10-20 and col. 8, lines 45-65).

Regarding claim 5, Jain discloses the apparatus as claimed claim 1, wherein a homogenization (30) for homogenizing the laser radiation is arranged between the laser light source and the array of lens elements (see col. 7, lines 4-30).

Regarding claim 6, Jain discloses the apparatus as claimed in claim 1, wherein the array influencing elements (12) is designed as a modulator array with modulator elements (see col. 7, lines 5-25 and col. 8, lines 59-67).

Regarding claim 8, Jain discloses the apparatus as claimed in claim 1, wherein the array of influencing elements designed as a mirror array with mirror elements (see col. 7, lines 15-25).

Regarding claims 7 and 9, Jain discloses the apparatus as claimed in claim 6, wherein the modulator elements are designed as mirror elements that actuated that are the functional equivalent of electro-optic modulators or acousto-optic modulators or MEMS. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use an electro-optic modulator for the specific purpose of beam deflection, since it is known in the art and electro-optical modulators or MEMs are movable or deformable reflective surfaces that are controlled to reflect light.

Regarding claim 10, Jain discloses the apparatus as claimed in claim 8, wherein perforated mask (56) is arranged between the mirror array (12) and the object (2)-see the embodiment of figure 6.

Regarding claim 11, Jain discloses the apparatus as claimed in claim 1, wherein array influencing elements (12) can be controlled such way that partial beams the laser radiation impinge in a fashion offset from one another in time on the prescribable locations to which radiation is to be applied of the object, or on locations directly adjacent thereto (see col. 9, lines 35-49 and col. 10, lines 16-35).

Regarding claim 12, Jain discloses the apparatus as claimed in claim 1, wherein the apparatus comprises scanning means that permit the object to be scanned with reference to the apparatus (for example see col. 9, lines 40-50) or permit the apparatus to be scanned with reference to the object.

Regarding claim 27, Jain discloses an apparatus applying laser radiation object, comprising (see figure 1, 4, 6):

a laser light source (26) generating laser radiation;

a two-dimensional array influencing (12) elements that can deflect and/or pass the laser radiation issuing from the laser light source in such way that laser radiation is applied to prescribable locations on the object; and

two-dimensional array of lens (10) elements that can focus the laser radiation portions the laser radiation onto the surface which radiation is to be applied - of the object; wherein the array of influencing elements can be controlled in such way that partial beams of the laser radiation impinge in a fashion offset from one another in time on the prescribable locations which radiation is to be applied the object, or on locations directly adjacent thereto (for example see col. 9, lines 35-49 and col. 10, lines 16-35). However, Jain fails to specifically disclose an embodiment wherein the scanning means permit the array of lens elements to be scanned with reference to the object and/or to the array of influencing elements.

In the same field of endeavor, Henningsen discloses an exposure system with a laser light source (21), array of influencing elements (24,25) and array of lens elements (23) such that a scanning apparatus permit the array of lens elements to be scanned with reference to the object (see col. 11, 50-67; col. 12; col. 13, lines 35-55). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include an scanning mean that permit the array of lens elements to be scanned as claimed, for the specific purpose of patterning an object with high illumination efficiency and resolution.

Regarding claim 28, Jain discloses the apparatus as claimed in claim 27, wherein the desired laser power can be introduced into

prescribable area on the surface - to which radiation is being applied of the object by spatial and/or temporal summation (see col. 9, lines 35-49 and col. 10, lines 16-35).

Regarding claim 29, Jain discloses the apparatus claimed claim 27, wherein the apparatus comprises a mirror arrays with mirror elements that are arranged in such way that it is possible to generate partial beams the laser radiation that impinge asymmetrically relation to the normal to the surface to which radiation to be applied object (see col. 9, lines 40-49 and col. 10, lines 15-35). However Jain fail to specifically disclose an embodiment with two mirror arrays It would have been obvious to one of ordinary skill in the art at the time the invention was made to include two mirror arrays, since it has been held that mere duplication of essential working parts of a device only involves routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8 and for the specific purpose of adding more control to the beam deflection

Regarding claim 30, Jain discloses the apparatus as claimed claim 27, wherein the apparatus comprises scanning means that permit the object to be scanned reference to the apparatus, or permit the apparatus to scanned with reference to the object (see col. 9, lines 40-49).

Regarding claims 33, 35, 36 and 38, Jain disclose an exposure apparatus for exposing a pattern on a substrate (object)- see abstract).

7. Claims 15-24,34,37,39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jain et al (US 6,515,257) in view of Mizouchi (US 5,963,305).

Regarding claim 15, Jain discloses an apparatus applying laser radiation comprising:

laser light source (26) generating laser radiation;
two-dimensional array influencing elements (12) that can deflect and/or pass the laser radiation issuing from the laser light source in such way that laser radiation applied to prescribable locations on the object; and
two-dimensional array of lens elements (10) that can focus the laser radiation or portions of the laser radiation onto the surface to which radiation is applied of the object.

Jain fails to specifically disclose the apparatus as claimed in claim 1, wherein the lens elements (10) are designed as mutually crossed cylindrical elements or elements similar to cylindrical lenses.

Mizouchi discloses a laser exposure system where the array of two-dimensional cylindrical lens element focus (631,632;see figure 12 for example) the laser radiation onto a two dimensional influencing element (for example 101,1012; col. 10). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a cylindrical array of lens elements for the specific purpose of focus light on the influencing elements with increased intensity (focus power) and ease of varying the illumination shape impinging the object.

Regarding claim 16, Jain discloses he apparatus as claimed claim 15, wherein a homogenization unit (30) for homogenizing the laser radiation arranged between laser light source and the array of lens elements (for example see col. 7, lines 4-30).

Regarding claim 17, Jain discloses the apparatus as claimed 15, wherein the array of influencing elements (12) is as modulator array with modulator elements (for example se col. 7, lines 5-25 and col. 8, lines 59-67).

Regarding claims 18 and 20, Jain discloses the apparatus as claimed in claim 15, wherein the modulator elements are designed as mirror elements that actuated that are the functional equivalent of electro-optic modulators or acousto-optic modulators or MEMS. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Jain in view of Tanaka, to use a electro-optic modulator for the specific purpose of beam deflection, since it is known in the art and electro-optical modulators or MEMs are movable or deformable reflective surfaces that are controlled to reflect light.

Regarding claim 19, Jain discloses the apparatus as claimed in claim 15, wherein the array of influencing elements (12) is designed as mirror array with mirror elements (see col. 7, lines 15-25).

Regarding claim 21, Jain discloses the apparatus as claimed in claim 19, wherein perforated mask (58) is arranged between the mirror array and the object (for example see the embodiment of figure 6).

Regarding claim 22, Jain discloses the apparatus claimed claim 15, wherein the array influencing elements can be controlled in such a way that partial beams of the laser radiation impinge fashion offset from one another time on the prescribable locations which radiation is applied - of the object, or locations directly adjacent thereto (for example see col. 9, lines 35-49 and col.10, lines 16-35).

Regarding claims 23 and 39, Jain discloses the apparatus as claimed in claim 19, wherein the apparatus comprises two mirror arrays with mirror elements that are arranged in such a way that it is possible to generate partial beams of the laser radiation

that impinge asymmetrically in relation to the normal to the surface - to which radiation is to be applied - of the object.- The mirrors (titling), fibers or substrate can be controlled to move to align the beams in desired locations –for example see col. 10, lines 16-35. Mizouchi also discloses asymmetrical impingent-see col. 10 for example.

Regarding claim 24, Jain discloses the apparatus as claimed in claim 1, wherein the apparatus comprises scanning means that permit the object to be scanned with reference to the apparatus (for example see col. 9, lines 40-50) or permit the apparatus to be scanned with reference to the object.

Regarding claims 34 and 37, Jain disclose an exposure apparatus for exposing a pattern on a substrate (object)- see abstract).

8. Claims 25,26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jain et al (US 6,515,257) in view of Mizouchi (US 5,963,305), further in view of Henningsen (US 6,529,265).

Regarding claim 25, Jain and Mizouchi fail to specifically disclose the apparatus comprises scanning means that permit the array of lens element to be scanned with reference to object.

In the same field of endeavor, Henningsen discloses an exposure system with a laser light source (21), array of influencing elements (24,25) and array of lens elements (23) such that a scanning apparatus permit the array of lens elements to be scanned with reference to the object (see col. 11, 50-67; col. 12; col. 13,lines 35-55). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was

made to include an scanning mean that permit the array of lens elements to be scanned as claimed, for the specific purpose of patterning an object with high illumination efficiency and resolution

Regarding claim 26, Jain fails to disclose an embodiment where the array of lens elements is tilted slightly to a scanning direction. However, Mizouchi discloses an embodiment in figure 5 where the lens array can be tilted with respect the scanning direction (see col. 6 and col. 7, lines 1-45). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Jain, as taught by Mizouchi, for the specific purpose of changing the intensity distribution of the light impinging the object.

9. Claims 4,14,32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jain et al (US 6,515,257) in view of Henningsen (US 6,529,265), further Mizouchi (US 5,963,305).

Regarding claim 4, Jain and Henningsen fail to specifically disclose the apparatus as claimed in claim 1, wherein the lens elements (10) are designed as mutually crossed cylindrical elements or elements similar to cylindrical lenses.

Mizouchi discloses a laser exposure system where the array of two-dimensional cylindrical lens element focus (631,632; see figure 12 for example) the laser radiation onto a two dimensional influencing element (for example 101,1012; col. 10). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a cylindrical array of lens elements for the specific purpose of focus

light on the influencing elements with increased intensity (focus power) and ease of varying the illumination shape impinging the object.


Regarding claims 14 and 32, Jain and Henningsen fail to disclose an embodiment where the array of lens elements is tilted slightly to a scanning direction. However, Mizouchi discloses an embodiment in figure 5 where the lens array can be tilted with respect the scanning direction (see col. 6 and col. 7, lines 1-45). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Jain, as taught by Mizouchi, for the specific purpose of changing the intensity distribution of the light impinging the object.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alicia M. Harrington whose telephone number is 571 272 2330. The examiner can normally be reached on Monday - Thursday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 571 272 2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



AMH

Alicia M Harrington
Examiner
Art Unit 2873